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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,060	06/05/2006	Pieter Lodewikus Swart	050588/299058	6372

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EXAMINER
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BUI PHO, PASCAL M

ART UNIT	PAPER NUMBER
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2878

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/551,060	<b>Applicant(s)</b> SWART ET AL.	
	<b>Examiner</b> Pascal M. Bui-Pho	<b>Art Unit</b> 2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>20051206</u> . | 6) <input type="checkbox"/> Other: ____  |

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Drawings*

2. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because Figures 3 and 4 are of insufficient quality. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

### *Claim Objections*

3. Claim 15 is objected to because of the following informalities: in line 1, "method of monitoring" should be changed to --method for monitoring--; in line 4, a comma "," should follow "the member".

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 2, 5-8, and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Li et al. (US 6,876,785).

**With regards to claim 1**, Li et al. disclose in Fig. 5 a system (500) for monitoring a variable (temperature, strain) relating to a rotating member (504), the system comprising: a source of optical energy (522) for emitting optical energy; at least one transducer (300) mountable on the member and which transducer in use modulates optical energy received from the source in accordance with changes in the variable; and an optical transmission system (510) mountable between the source and the member for transmitting through free space optical energy between the member and the source.

**With regards to claim 2**, Li et al. disclose a system (500) wherein the optical source (522) is mounted at a station (520, 524) that is inherently stationary and comprises a broadband optical source (Column 7, lines 64-66) coupled to a first length of optical fiber (516). One of ordinary skill in the art would recognize that said station must be stationary in order to receive and/or analyze error free results.

**With regards to claim 5**, Li et al. disclose a system (500) wherein the transducer (300) comprises a second length of optical fiber (506, 508) and an optical energy modulating arrangement (300) connected to the second length of optical fiber.

**With regards to claims 6-8**, Li et al. disclose a system (500) wherein the modulating arrangement comprises a first and second optical energy reflective element mounted on the member (504) in a spaced relationship with a first and second Bragg grating having respective center frequencies which are spaced in wavelength, respectively (Column 8, lines 43-65).

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**With regards to claim 15**, Li et al. disclose in Fig. 5 a method for monitoring a variable (temperature, strain) relating to a rotating member (504), the method comprising the steps of: transmitting (522) optical energy through free space towards the member; on the member, causing the energy to be modulated in accordance with the variable to be monitored via sensing means (300); transmitting (508, 512, 518) from the member and via free space the modulated energy to a station (520, 524) that is inherently stationary, as explained above; and analyzing (524) said modulated energy at the stationary station.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3, 4, and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. (US 6,876,785).

**With regards to claims 3 and 4**, Li et al. disclose in Fig. 5 a system (500) for monitoring a variable (temperature, strain) relating a rotating member (504) comprising, among other features, a first lens (510) mountable on a stationary platform, but lack clear disclosures of a second lens being mountable on the member in substantial alignment with the first lens and said lenses being graded-index lenses. Selecting known available optics to modulate optical energy would have been obvious to one of ordinary skill in the art. Accordingly, at the time of the invention, it would have been obvious to modify Li et al. by including a second lens in

substantial alignment with the first lens and utilize graded-index lenses in order to reduce light loss and output more reliable sensing results.

**With regards to claims 9-11**, Li et al. disclose a system (500) wherein the first and second elements (300) are mounted on the member (504) in an inherent relationship with one another, but lack a clear disclosure of said relationship being overlapping, at ninety degrees, or at an angle of forty-five degrees to a longitudinal axis of the rotating member. Selecting a specific position for said elements in order to provide optimal and/or more desirable sensing results would have been obvious to one of ordinary skill in the art. Accordingly, it would have been obvious modify Li et al. by placing the elements in a relationship of overlap, ninety degrees, or an angle of forty-five degrees to a longitudinal axis of the rotating member, in order to output more reliable sensing results.

8. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. (US 6,876,785) in view of Chliaguine et al. (US 6,876,786).

**With regards to claims 12 and 13**, Li et al. disclose in Fig. 5 a system (500) for monitoring a variable (temperature, strain) relating to a rotating member (504) comprising, among other features, optical energy emitted by a source (522) and modulated energy propagating from a transducer (300), but lack a clear inclusion of means to separate said energies. In an analogous sensing art, Chliaguine et al. disclose in Fig. 2a a system comprising a bi-directional coupler (40) known in the art to be functionally equivalent to an optical circulator (Column 6, lines 11-12) having a first port connected to a source (31) and a second port connected to an output directed to a transducer (20). Selecting a known available means to separate optical and modulated energy would have been obvious to one of ordinary skill in the

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art. Accordingly, it would have been obvious to modify Li et al. by including an optical circulator, as taught by Chliaguine et al., in order to provide a more compact design and reduce manufacturing costs.

**With regards to claim 14**, Li et al. disclose output being connected to means (20) sensitive to modulation of the optical energy.

***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Pascal M. Bui-Pho whose telephone number is (571) 272-2714. The Examiner can normally be reached on Monday through Friday: 8:30 a.m. - 5:00 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Georgia Epps can be reached on (571) 272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Pascal M. Bui-Pho  
Examiner, Art Unit 2878  
29 August 2007

  
Georgia Epps  
Supervisory Patent Examiner  
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